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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/442,353	11/17/1999	HIRONORI KIKKAWA	NEM-01701	5715

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BOSTON, MA 02110

EXAMINER

NGO, HUYEN LE

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 01/29/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/442,353

Applicant(s)

KIKKAWA ET AL.

Examiner

Julie-Huyen L. Ngo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-6,8,9,12-14,25 and 26 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-6,8,9,12-14,25 and 26 is/are rejected.
- 7) ☒ Claim(s) 1,2,4-6, 8, 9, 12-14,25 and 26 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

Claims 1, 2, 5, 6, 9, 12-14, 25 and 26 are objected to because of the following informalities:

Claim 1 is objected to because it appears that the word other should be inserted after the word "each" on line 2. ✓

Claim 2 is (repeated for Applicant's attention) objected to because the language used to describe "the reflective layer is constituted on the same plane" is improper since it appears that the reflective layer is **formed** on the same plane as that of the gate electrode. ✓

Claim 5 is (repeated for Applicant's attention) objected to because it appears from figure 2 that the light-shielding layer is disposed on an area of only ONE switching element. ✓

Claim 8 is objected to because it appears that the word is formed of should be inserted after the word "reflective layer" on line 2. ✓

Claim 12 is objected to because it appears from the description of figure 2 that there are more than one **rough** portions (100) formed under the reflective film. Also the recitation calling for "the lower layer of said reflective layer," on line 3 of claim 12, lacks antecedent and is unclear of which layer Applicant referred to. It would be clear to recite according to what appears from the drawing (figure 2), which shows the rough portions formed on the substrate and under the reflective layer.

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Claim 12 is objected to because the recitation calling for "the lower layer," in the line 3 of the claim is unclear of which layer Applicant is referred to. A similar problem exists in the last clause of claims 25 and 26.

Claims not specifically mentioned above are objected to as bearing the defect(s) of the claim(s) from which they depend.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Sketch Claims 8 and 9 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 8 is rejected to because the recitation calling for the reflective layer formed of "at least one of aluminum and an aluminum alloy" was not described in the specification as originally filed. The recitation calling for a broader scope of invention, which can be construed that the reflective layer is formed of a different material other than an aluminum or an aluminum alloy. According to the specification (page 5, lines 19-20), the reflective layer is ^{only} formed of either aluminum or an aluminum alloy only.

Claim 9 is rejected to as bearing the defect(s) of claim 8 from which it depends.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4-6, 8, 12, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata et al. (US 6,118,505) in view of Ukita et al. (US 5,940,154).

Nagata et al. disclose, in figs. 2 and 4, a Liquid Crystal Device comprising all the limitations recited in claims 1, 2, 4-6, 8, 12, 25 and 26 except for a reflective layer formed over a rough portion and formed/constituted of a same material of a gate electrode and simultaneously formed during the formation of the switching element or the gate electrode of each switching element.

Ukita et al teach (col. 10, line 55 to col. 11, line 21 and figure 5) forming aluminum or an aluminum alloy reflective layer over rough portions of a substrate and only under the pixel electrode (6) for reflecting light through a pixel region. Doing so would significantly reduce light from entering the Thin Film Transistor (20)'s semiconductor layer (7), which would not decrease in an off-resistance. Accordingly the leakage current would decrease and no deterioration in display grade would occur.

Therefore, it would have been obvious to one of ordinary skilled in the art to form rough portions on the substrate (1) in the device of Nagata et al., and then form a reflective layer over the rough portions on said substrate for reducing light from entering

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the Nagata et al.'s thin film transistor (7) and for the reasons as set forth above, as taught by Ukita et al.

Furthermore, (claim 2) since both the Nagata et al. thin film transistor (7)'s gate electrode (2) and the Ukita et al device's reflective layer (2) are formed of a metal material and are formed on a substrate, it would have been obvious for one of ordinary skilled in the art to ~~simultaneously~~ ^{simultaneously} form the reflective layer during the formation of the gate electrode ^{that} from a same material and on a same plane as ^{the plane} of the gate electrode, i.e. the substrate (1), for reducing manufacturing steps, and ensuring lower fabrication cost and a higher fabrication yield.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata et al. in view of Ukita et al. as applied to claims 1 and 8 above, and further in view of Seiki et al (US 5,811,835).

It is well known in the art for gate electrodes to compose of a low-resistance metal, such as aluminum (Al), coated with chromium (Cr), tungsten (W), titanium (Ti), tantalum (Ta), or some other metal whose melting point is higher than that of aluminum such as neodymium or with an aluminum alloy so that a hillock, blister, etc. of aluminum can be effectively prevented, as evidenced by Seiki et al (col. 1, lines 25-32 and col. 3, lines 30-40).

Therefore, it would have been obvious to one of ordinary skilled in the art to form the reflective layer and the gate electrode in the device of Nagata et al. in view of Ukita et al, of an alloy of aluminum and neodymium for the reasons set forth above, as taught by Seiki et al.

Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata et al. in view of Ukita et al. as applied to claim 1 above, and further in view of Kimura (US 5,610,741).

Kimura teaches (figures 13&14 and col. 15, line 61 to col.16, line 36) patterning a photo resist film or insulation film to form rough portion(s) under a reflective layer (col. 16, lines 63-67) for effectively reflecting light. It is well known in the art to form a photo resist film of a material, which is not deformed in a heating process performed later, and which does not contain high density impurities adversely affecting a liquid crystal display.

Therefore, it would have been obvious to one of ordinary skill in the art to pattern rough portion(s) under the reflective layer (2), in the device of Nagata et al. in view of Ukita et al., from a photoresist film or an insulation film for the reasons set forth above, as taught by Kimura.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Response to Arguments

Applicant's arguments filed January 9, 2002 have been fully considered but they are not persuasive.

Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

More over, Applicant's arguments were against the references individually. Applicant is to note that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

The rejection as set forth above are based on combinations of references as follow:

The Ukita et al reference is relied on for its motivation to form a reflective layer over a rough portion(s) formed on a substrate in the device of Nagata et al. as set forth above in the rejection of claims 1, 2, 4-6, 8, 12, 25 and 26.

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The Seiki et al's teaching is used to form the reflective layer and the gate electrode in the device of Nagata et al. in view of Ukita et al from an alloy of aluminum and neodymium for the motivation set forth above in the rejection of claim 9.

Furthermore, Kimura's teaching is used to pattern rough portions formed of a photoresist film or an insulation layer under a reflective layer in the device of Nagata et al. in view of Ukita et al. for the motivation as set forth above in the rejection of claims 13 and 14.

Therefore, the cited references as combined by their motivations fully meet all the limitations recited in the claims.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julie-Huyen L. Ngo, whose telephone number is (703) 305-3508. The Examiner can normally be reached on T-F.

If attempts to reach the examiner by telephone are unsuccessful, the Examiner's Supervisor, William L. Sikes can be reached on (703) 308-4842.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist, whose telephone number is (703) 308-0956.

JLN

January 25, 2002



William L. Sikes

Supervisor Patent Examiner

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